

Before the  
**FEDERAL COMMUNICATIONS COMMISSION**  
Washington, D.C. 20554

In the Matter of	)	
	)	
Revision of Parts 2 and 15 of the	)	ET Docket No. 03-122
Commission's Rules to Permit Unlicensed	)	
National Information Infrastructure (U-NII)	)	
Devices in the 5 GHz Band	)	

**COMMENTS OF THE LICENSE-EXEMPT ALLIANCE**

The License-Exempt Alliance (“LEA”), by its counsel, hereby submits its comments in response to the Commission’s *Notice of Proposed Rulemaking* (“NPRM”) in the above-captioned proceeding.

**I. INTRODUCTION.**

The LEA is a nationwide coalition of wireless Internet service providers (“WISPs”) and equipment vendors who provide or support the provision of broadband service via license-exempt spectrum in the 902-928 MHz, 2.4 GHz and 5 GHz bands. It has been and continues to be the primary advocate for “last mile” license-exempt broadband providers in Commission proceedings that directly affect the allocation and use of license-exempt spectrum. As recognized in the *NPRM*, the last-mile networks built and operated by the LEA’s membership “offer significant benefits for American consumers and businesses,” including “the possibility of increased competition with other providers of broadband service, including cable and digital subscriber line (DSL) broadband services.”<sup>1</sup> Plainly, the LEA has a direct and immediate interest in the *NPRM* and the proposals set forth therein.

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<sup>1</sup> *NPRM* at ¶ 12.

As a general matter, the LEA applauds the Commission's proposal to make the 5.475-5.725 GHz band available for use by Unlicensed National Information Infrastructure ("U-NII") devices. At a minimum, the new allocation should relieve frequency congestion in the U-NII bands, a highly relevant consideration for outdoor license-exempt providers who must contend with interference from indoor wireless LAN operations operating in the same spectrum. The LEA also recognizes that the technical rules proposed in the *NPRM* are largely the by-product of an overriding agreement with the Department of Defense, and that the Commission has little leeway to deviate from the terms of that agreement in this proceeding. Accordingly, the LEA does not challenge those particular aspects of the *NPRM* in these comments.

At the same time, however, there are portions of the *NPRM* that are disturbing to the rapidly increasing number of license-exempt operators who are now providing outdoor, wide-area broadband service to hundreds of thousands and soon millions of subscribers, particularly in rural and other areas that have little or no broadband service. In particular, the LEA is troubled by the Commission's apparent assumption that the 100 MHz at 5.725-5.825 MHz is adequate for higher power outdoor operations (*i.e.*, more than 1 watt), and that outdoor providers in that spectrum can make do with what they have. As shown below, this assumption is factually erroneous and, more important, is at odds with the Commission's recent emphasis on finding more spectrum for license-exempt operations and permitting license-exempt operators to use higher power. The LEA is hopeful that the Commission's statements on these issues in the *NPRM* are an aberration, and urges the Commission to remain charted on its prior course of regulatory reform targeted at optimizing the benefits of last-mile license-exempt service.

## II. DISCUSSION.

As the LEA has described in its comments in other pending Commission proceedings, the growth of license-exempt “last mile” broadband service is one of the few *bona fide* success stories in the communications industry over the past several years.<sup>2</sup> According to one industry analyst, approximately 1,500-1,800 WISPs already are providing license-exempt broadband service to approximately 600,000 subscribers in the U.S., with subscribership expected to double by the end of 2003 and reach nearly 2,000,000 by the end of 2004.<sup>3</sup> A sample list of some of the more successful WISPs is attached hereto as Exhibit A – in virtually all cases, each of the listed operators was created because incumbents wired providers were offering little or no broadband service to their communities.

Equally important, the Commission has already observed that “lowerband” wireless service (including that provided via license-exempt spectrum) is uniquely suited for rural areas:

Several smaller fixed wireless carriers, including hundreds of operators using unlicensed spectrum, continue to provide high-speed Internet access service, generally in less densely populated markets across the country . . . . Many fixed wireless operators use lowerband spectrum to offer high-speed Internet access in rural and underserved areas. . . . In fact, at least one industry analyst claims that, while fixed wireless has the potential to compete with DSL and cable modem service, the technology is best-suited for rural and underserved markets where these services may not be available.<sup>4</sup>

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<sup>2</sup> See, e.g., Comments of the License-Exempt Alliance, IB Docket No. 02-364 (filed July 11, 2003); Reply Comments of the License-Exempt Alliance, ET Docket No. 02-380 (filed May 16, 2003); Comments of the License-Exempt Alliance, WT Docket No. 02-381 (filed February 3, 2003); Comments of the License-Exempt Alliance, ET Docket No. 02-135 (filed January 27, 2003); Comments of the License-Exempt Alliance, RM-10403 (filed May 15, 2002);

<sup>3</sup> See [http://www.wcai.com/pdf/2003/p\\_instatmdrJan22.pdf](http://www.wcai.com/pdf/2003/p_instatmdrJan22.pdf); “The License-Exempt Wireless Broadband Market,” Alvarion, Inc., at 8 (April 2003) (“Alvarion Report”), submitted as an attachment to *Ex Parte* Letter of License-Exempt Alliance, RM-10371 (filed April 30, 2003) (“LEA Letter”).

<sup>4</sup> *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993 – Annual report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services (Seventh Report)*, FCC 02-179, Appendix A at 6-7 (rel. July 3, 2002) (footnotes omitted). Of course, the provision (continued on next page)

Furthermore, recent developments in the standards-setting process will only accelerate last mile broadband deployments over license-exempt spectrum. By now the Commission is aware of the recently-adopted IEEE 802.16a standard, which will support delivery of outdoor broadband service over license-exempt spectrum at distances up to 30 miles, with a typical cell radius of 4-6 miles.<sup>5</sup> As recently noted by Intel, “[w]ith shared data rates up to 75 Mbps, a single ‘sector’ of an 802.16(a) base station – where sector is defined as a single transmit/receive radio pair at the base station – provides sufficient bandwidth to simultaneously support more than 60 businesses with T1 connectivity, using 20 MHz of channel bandwidth.”<sup>6</sup> According to one analyst, “under the current conditions, 802.16a could emulate 802.11’s rise several years from now,” potentially reaching \$1 billion in sales by 2008.<sup>7</sup>

Until the release of the *NPRM*, it appeared that the Commission was cognizant of the unique public interest benefits of last-mile license-exempt broadband service, and had undertaken a comprehensive effort to find additional spectrum for higher power license-exempt operations. Indeed, in direct response to the November 2002 Report of its Spectrum Policy Task Force, the Commission has already commenced proceedings in which it has proposed to permit

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of broadband service to rural communities remains among the Commission’s highest priorities. *See, e.g., Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996 (Third Report)*, 17 FCC Rcd 2844, 2888 (2002).

<sup>5</sup> *See* IEEE 802.16 and WiMAX – Broadband Access for Everyone,” Intel Corporation White Paper, at 3 (2003) (“Intel White Paper”). Wooley, “Wider-Fi,” *Forbes* (Apr. 14, 2003) (available at [www.forbes.com](http://www.forbes.com)) (802.16a “extends the wireless range of Wi-Fi from roughly 300 feet to several miles and lets signals bounce around obstacles and penetrate walls; it also fixes security flaws and adds high-quality phone calls”).

<sup>6</sup> Intel White Paper at 3.

<sup>7</sup> *See* <http://www.visantstrategies.com/pr80216.htm>

license-exempt operations in the 2500-2690 MHz band,<sup>8</sup> the 2483.5-2500 MHz band,<sup>9</sup> the television broadcast bands below 900 MHz,<sup>10</sup> and the 3650-3700 MHz band.<sup>11</sup> Furthermore, in all but the 2483.5-2500 MHz band, the Commission has asked for comment on whether and under what circumstances it should permit license-exempt operators to operate at power levels greater than 1 watt. Similarly, but in a more general vein, the Commission has asked for comment on whether and how it could permit license-exempt operations in rural areas at power levels greater than 1 watt.<sup>12</sup>

Against this backdrop, the LEA is mystified as to why the Commission would now suggest in the *NPRM* that “the 100 MHz of spectrum that is already available at 5.725-5.825 GHz will remain sufficient for higher power operations,” and that “operations over longer distances employ directional antennas that allow for high reuse and sharing of the spectrum, which mitigates the need for additional spectrum for these types of operations.” If the 5.725-5.825 GHz band were truly sufficient to sustain the growth of last-mile license-exempt broadband service, then presumably the Commission would have little need to search for

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<sup>8</sup> See *Amendment of Parts 1, 21, 73, 74 and 101 of the Commission’s Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 MHz and 2500-2690 MHz Bands*, 18 FCC Rcd 6722, 6783 (2003).

<sup>9</sup> See *Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands*, 18 FCC Rcd 1962, 2091 (2003).

<sup>10</sup> See *Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band*, 17 FCC Rcd 25632, 25639 (2002).

<sup>11</sup> *Id.* at 25642.

<sup>12</sup> See *Facilitating the Provision of Spectrum-Based Services to Rural Areas and Promoting Opportunities for Rural Telephone Companies to Provide Spectrum-Based Services*, 17 FCC Rcd 25554, 25569 (2002).

additional spectrum for higher power license-exempt operations, as it is already doing in the proceedings cited above. The LEA assumes that the Commission merely misspoke in the *NPRM*,<sup>13</sup> and thus requests that the Commission clarify that the *NPRM* does not represent a reversal of position on the issue of higher power.

As to specific technical issues raised in the *NPRM*, the LEA has the following initial reactions:

- The *NPRM* never addresses the critical issue of how the DFS detection mechanism in an unlicensed device at 5.470-5.725 GHz is supposed to tell the difference between what is a government radar signal and what is not. Unless the Commission provides some specific guidance on this issue, license-exempt providers in the 5.470-5.725 GHz band will be constantly exposed to service shut-downs triggered by non-radar signals transmitting at the Commission's proposed DFS thresholds. This is of particular importance to last-mile license-exempt broadband providers, since they must deliver "always on" service in order to retain their customers.
- The Commission is proposing to require that U-NII devices "continuously monitor their environment for the presence of radars both prior to and during operation."<sup>14</sup> In this context, "continuously monitor . . . prior to" is very vague – does it refer to one minute prior, one hour prior, or something else? Again, it is difficult for the LEA to comment on this issue in the absence of a more specific proposal. As a general matter, however, the LEA believes that "continuous monitoring" should only be required to begin immediately prior to installation of the device at issue – anything else is unnecessary and unreasonable.
- The LEA agrees that  $10 \cdot \log(BW/1 \text{ MHz})$  (where BW is the U-NII device's bandwidth) is the appropriate correction factor for U-NII devices that have a bandwidth less than 1 MHz.<sup>15</sup>
- Where a system uses multiple devices operating under a central controller, the Commission should only require that the central controller have DFS capability.<sup>16</sup>

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<sup>13</sup> *NPRM* at ¶ 18.

<sup>14</sup> *Id.* at ¶ 20 (footnote omitted).

<sup>15</sup> *Id.* at ¶ 21.

<sup>16</sup> *Id.* at ¶ 22.

- The Commission requests comment as to the minimum number of pulses and dwell time required for reliable detection of radar signals.<sup>17</sup> The key fact that is missing here is the sample integration time for measuring the amplitude of the radar signal. If integration occurs over a period comparable with the pulse repetition rate and the repetition rate is very slow compared with the pulse duration within the received bandwidth (as is typically the case), then the receive power will be greatly reduced relative to the instantaneous power.
- As to appropriate test procedures to measure compliance with the Commission's proposed DFS and transmit power control ("TPC") requirements, the LEA believes that it may be feasible for the Commission to use the notification requirements in Part 101, under which manufacturers are responsible for performing the necessary tests and submitting notification of acceptable results.<sup>18</sup> However, to ensure accurate results, test procedures should be lab-based, not field based.
- Finally, under no circumstances should the Commission adopt its proposed transition periods for devices in the 5.250-5.350 GHz unless the record supplies convincing evidence that those periods are long enough not to disrupt existing operations in that band.<sup>19</sup> It must be remembered that as license-exempt services continue to proliferate, the 5.250-5.350 GHz is becoming increasingly important to outdoor operators who need "fallback" spectrum in the event that the 5.725-5.825 GHz band becomes too congested. Those operators, obviously, stand to be at substantial risk of service disruption if DFS-capable equipment is not available for the 5.250-5.350 GHz band at the close of the Commission's proposed transition periods.

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<sup>17</sup> *Id.* at ¶ 23.

<sup>18</sup> *Id.* at ¶ 25.

<sup>19</sup> *Id.* at ¶ 26.

## LICENSE-EXEMPT ALLIANCE

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## **EXHIBIT A**

- **AMA Tech Tel** ([www.amatechtel.com](http://www.amatechtel.com)) provides a variety of license-exempt broadband services with a wireless footprint covering over 20,000 square miles in and around Amarillo, Texas.<sup>20</sup> The company currently has over 4,000 wireless broadband subscribers and anticipates adding 8,000 more within the next 12-18 months.<sup>21</sup> Just days ago the company announced that it has entered into a groundbreaking partnership with Texas Tech University to build and maintain a wireless broadband telecommunications backbone stretching from Amarillo to Hobbs, New Mexico. The backbone will provide access to high-speed telecommunications to the rural communities along its route. Principally, the backbone will be a wide-area network for delivery of content to be used in small business development, work force training and other adult and K-12 educational programs.<sup>22</sup>
- **Prairie iNet** ([www.prairieinet.net](http://www.prairieinet.net)) currently provides license-exempt broadband service in the 2.4 GHz and 5.8 GHz bands to approximately 4,500 subscribers, encompassing a total of 127 communities in Iowa, Illinois and Montana. In addition to residential and business customers, the company provides service to schools, medical clinics and municipal governments. The company estimates that it is the sole provider of broadband service in approximately half of its markets.<sup>23</sup>
- **Suburban Broadband LLC** recently announced that it has entered into an agreement with **Waverider Communications, Inc.** ([www.waverider.com](http://www.waverider.com)) to bring broadband service to 14 counties along the Front Range of Colorado, representing more than 80% of the state's population. WaveRider's Last Mile Solution wireless systems have been deployed by service providers in 43 states, making license-exempt broadband service available to potentially hundreds of thousands of subscribers across the country.<sup>24</sup>

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<sup>20</sup> See *Ex Parte* Presentation of AMA Tech Tel, RM-10371, at 4 (April 2003) ("AMA Tech Tel Report"), submitted as an attachment to the LEA Letter.

<sup>21</sup> See Alvarion Report at 9; AMA Tech Tel Report at 4.

<sup>22</sup> See "Texas Tech University Signs Agreement to Build Network to Improve Internet Access to Rural Areas," Joint Press Release of Texas Tech University and AMA Tech Tel (July 2, 2003), available at [http://www.wcai.com/press\\_mem2001.htm](http://www.wcai.com/press_mem2001.htm).

<sup>23</sup> See <http://www.wcai.com/interview.htm>.

<sup>24</sup> See also Barthold, "Wireless Internet Opens Communications in Small Iowa Communities," *TelephonyOnline.Com* (Sept. 4, 2002) (discussing Airolink's launch of license-exempt broadband service in rural Iowa communities).

- **NextWeb** ([www.nextweb.net](http://www.nextweb.net)) has joined forces with SkyPipeline and SkyRiver Communications to create the SkyWeb Alliance, a unified fixed wireless carrier that will serve more than 150 cities in a 5,600 square mile area in California, potentially serving half of the business establishments in the State with broadband wireless connectivity. SkyWeb's coverage area stretches from the San Francisco and Silicon Valley areas to Southern California, including the greater Los Angeles, Orange County and San Diego regions. In the future, the SkyWeb network could be used to serve many of the 4.5 million residential households that are within the SkyWeb coverage area.<sup>25</sup>
- **Wheatland Electric** ([www.wbsnet.org](http://www.wbsnet.org)) is a local cooperative electric utility provider to 40,000 businesses, schools and residences in an eleven-county rural area of western Kansas. Though relatively new, its Wheatland Broadband subsidiary now has approximately 1,100 buildings online in only the first initial phases of deployment. Wheatland's wireless system is capable of serving customers as far as 18 miles from a base station.<sup>26</sup>
- **Allconet** (<http://prime.allconet.org/allconet2/>) operates in Allegany County, Maryland, in the foothills of the Appalachian Mountains. Allconet is among the most sophisticated municipally owned license exempt wireless broadband systems in the United States, connecting every government and other public entity in the area (over 90 buildings in total, including every school, library, municipal office, police station house, etc.). It is anticipated that this year the system will expand to provide broadband access to approximately 85% of the residents, 95% of the businesses and 100% of the government and industrial parks in the County.
- **Midwest Wireless**, a mobile wireless service provider with over 250,000 customers, has deployed Alvarion equipment to deliver license-exempt broadband service to communities encompassing 3,500 square miles in rural Minnesota. The company has already rolled out the service in 30 communities, many of which have little or no other broadband service.<sup>27</sup>

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<sup>25</sup> See "California's Leading Wireless ISPs Join Forces to Create SkyWeb Alliance for Broadband Internet Services," available at <http://www.skyweballiance.com/pressrelease.html>.

<sup>26</sup> See Alvarion Report at 10.

<sup>27</sup> See press releases at [http://www.alvarion.com/RunTime/CorpInf\\_30130.asp?fuf=270&type=item](http://www.alvarion.com/RunTime/CorpInf_30130.asp?fuf=270&type=item) and [http://www.midwestwireless.com/mwc\\_about/mwc\\_about\\_press.asp?NewsDetailId=88](http://www.midwestwireless.com/mwc_about/mwc_about_press.asp?NewsDetailId=88).

- ***Northwest Communications***, a local exchange carrier serving in northwest Iowa, offers license-exempt broadband service in all of the license-exempt bands to residential and business subscribers in 22 rural communities from about 30 tower sites. In its original incarnation as a wired telephone company, the company's service area encompassed 23 square miles around Havelock, IA. By virtue of its wireless service, the company now operates across thousands of square miles in some 60 communities.<sup>28</sup>
- The city of ***Ellasville, Georgia*** offers license-exempt broadband service in the 902-928 MHz band via WaveRider equipment. Presently, the city's system uses three transmitting antennas mounted on the city's main water tank, and permits access at speeds exceeding 300 Kbps at a distance of over two miles.<sup>29</sup> Also, WaveRider equipment is being used to build a high-speed wireless network in Fort Valley, Georgia through a project called ***GeorgiaSpeed.Net***. The project arose from a multi-year contract between the Fort Valley Utility Commission and Tri-State Broadband Inc. to install a hybrid fiber-wireless broadband network. The network will bring symmetrical Internet access speeds of up to 1.5 Mbps to Fort Valley and Peach County area businesses and residents.<sup>30</sup>
- ***Office Equipment of Odessa, WA*** has been providing license-exempt broadband service to rural communities in the Pacific Northwest since 1997. Its network presently covers 2,100 square miles in and around Odessa – nearly every community served by the company has a population of fewer than 1,000 people. Among other things, the company donates its service to local law enforcement in Odessa – as a result, police cars in the community have up to T1 speed VPN access directly into law enforcement computer networks. This is believed to be the first project of its type in the State of Washington.<sup>31</sup>
- ***Joink, Inc.*** ([www.joink.com](http://www.joink.com)) provides broadband service in the 902-928 MHz band to rural communities in western Indiana and eastern Illinois. The company has already launched the service in eight communities, with plans to add 30 more throughout its region. Joink delivers its service through a network of Authorized

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<sup>28</sup> See Blackwell, "Northwest Communications, Growing Against the Grain," available at [http://isp-planet.com/fixed\\_wireless/business/2002/northwest\\_comm.html](http://isp-planet.com/fixed_wireless/business/2002/northwest_comm.html) (Aug. 27, 2002).

<sup>29</sup> See Mackie, "City in Southwestern Georgia Deploys WaveRider's System," *Broadband Wireless Online* (July 3, 2002); Blackwell, "Small Cities Serve Their Own," [www.isp-planet.com](http://www.isp-planet.com) (June 25, 2002).

<sup>30</sup> See [http://isp-planet.com/fixed\\_wireless/wi-fi\\_briefs/2002/021107.html](http://isp-planet.com/fixed_wireless/wi-fi_briefs/2002/021107.html).

<sup>31</sup> See <http://www.wcai.com/interview.htm>.

Dealers, who provide customers with a local storefront through which they may obtain and pay for service. In addition, Joink has a Broadband Community Alliance program that permits a community leader to bring Joink's service to a small or underserved area.<sup>32</sup>

- **REA-ALP** is a utility cooperative in Alexandria, Minnesota serving approximately 7,000 customers. Using equipment supplied by Alvarion and WaveRider, it provides license-exempt broadband service via the 2.4 GHz and 902-928 MHz bands, competing with eight ISPs plus local cable modem and DSL service. REA-ALP is able to provide reliable non-line of sight service at distances up to 1.5 miles, and reliable line of sight service at distances up to 4.7 miles.<sup>33</sup>

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<sup>32</sup> See <http://www.waverider.com/en/news/releases/release.cfm?id=113>.

<sup>33</sup> See Sanders, "Hybridized 900 MHz NLOS Systems," *Broadband Wireless Business*, at 20 (July/August 2002).